Forests, Economics and Climate Change

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Review essay

Forests, economics, and climate change

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Books discussed in this essay

1. ***Deforestation and Climate Change: Reducing Carbon Emissions from Deforestation and Forest Degradation***, edited by Valentina Bosetti and Ruben Lubowski (Edward Elgar, 2010, 190 pp., £65.00, ISBN 9781848448247).
2. ***Climate Change: Financing Global Forests – The Eliasch Review***, by Johan Eliasch (Earthscan, 2008, 288 pp., pk £29.99, ISBN 9781844077731).
3. ***Payments for Environmental Services, Forest Conservation and Climate Change: Livelihoods in the REDD?***, edited by Luca Tacconi, Sango Mahanty, and Helen Suich (Edward Elgar, 2010, 288 pp., £69.95, ISBN 9781849802994).

The books reviewed here all deal with the role of avoided deforestation and sustainable forest uses in mitigating climate change. Negotiations on renewed commitments under the UNFCCC have drawn unprecedented attention to this issue. Forestry is a major contributor to anthropogenic climate change and accounts for around 12 to 18 per cent of global carbon emissions.[1] These emissions are largely associated with deforestation, that is, the net loss of forest cover that is not restored by subsequent reforestation or afforestation.

Since 2007 REDD has become a centrepiece in negotiations on long-term cooperative action under the Convention, as outlined in the Bali Action Plan.[2] Negotiations have since progressed rapidly and several proposals have been advanced, with significant differences in scope, reference levels for carbon crediting, and other design features.[3]

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[1] According to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change (IPCC), forestry accounts for around 17 per cent of global carbon emissions. Synthesis Report, at 36. According to more recent estimates, this number may be closer to 15 per cent; see G. R. van der Werf et al., *CO_2 Emissions From Forest Loss*, 2 Nature Geoscience 737 (2009).

[2] Cf. UNFCCC/COP13, *Decision 1/CP.13 Bali Action Plan* (2007), at 1(b) (iii).

[3] For a review, see C. Parker et al., The Little REDD+ Book: A Guide to Governmental and Non-Governmental Proposals For Reducing Emissions From Deforestation and Degradation (2009).

The volume *Deforestation and Climate Change*, edited by Valentina Bosetti and Ruben Lubowski, collects papers presented at an international workshop in November 2008, organised by Fondazione Eni Enrico Mattei (FEEM) and the Environmental Defense Fund (EDF). The volume covers policy-relevant research aimed at shedding light on some of the major concerns and challenges related to the inclusion of REDD in the international regime to fight climate change, as well as potential solutions. The papers cover developments preceding the 2009 Copenhagen COP.

The volume opens with an excellent overview of the history and current status of REDD under the UNFCCC by William Boyd (University of Colorado). The chapter explains how forests are both carbon sinks and sources under the Convention.[4] The treaty specifically mentions that policies and measures to deal with climate change should "be comprehensive, cover all relevant sources, sinks and reservoirs of greenhouse gases and adaptation, and comprise all economic sectors" (UNFCCC, article 3.3). The chapter also illustrates how this mandate has to date been only partially fulfilled in connection with forests, chiefly due to the approach taken by the Kyoto Protocol. Under the Protocol, GHG removals and emissions from forests can count towards Annex I parties' emission inventories in two ways: as part of a country's national balance of emissions and removals from LULUCF; and as credits from project activities in non-Annex I parties undertaken within the framework of the CDM. At present, the only forestry activities eligible for CDM credits are reforestation and afforestation—not avoided deforestation. This exclusion was justified by methodological questions being initially perceived as insurmountable obstacles to incentivizing avoided deforestation, as well as concerns about diverting attention away from the reduction of emissions from the combustion of fossil fuels.

The ensuing chapter by Federica Bietta (Coalition for Rainforest Nations) explains how the debate on emissions from avoided deforestation was reopened in 2005, when Papua New Guinea and Costa Rica tabled a submission on "draw[ing] developing countries towards emission reductions" by addressing emissions from deforestation, either by including them in the Kyoto Protocol or through an optional protocol under the UNFCCC.[5] This prompted the establishment of a program of work under the SBSTA on methodological issues related to policy approaches, as well as positive incentives for reducing emissions from deforestation and forest degradation in developing countries.[6]

The newly found enthusiasm for addressing emissions from avoided deforestation under the UNFCCC umbrella might be explained by a number of factors, including scientific and technological progress to address earlier technical concerns.[7] There is in addition increased awareness

[4] UNFCCC, article 4.1 (c, d).

[5] UNFCCC/Secretariat, *Reducing Emissions From Deforestation in Developing Countries: Approaches to Stimulate Action: Submission From Parties* (2005), at 8.

[6] UNFCCC/SBSTA, *Report on a workshop on reducing emissions from deforestation in developing countries* (2006); UNFCCC/SBSTA, *Report on the second workshop on reducing emissions from deforestation in developing countries* (2007); UNFCCC/SBSTA, *Report on the workshop on methodological issues relating to reducing emissions from deforestation and forest degradation in developing countries* (2008).

[7] See also W. Boyd, *Ways of Seeing in Environmental Law: How Deforestation Became an Object of Climate Governance*, 37 Ecology Law Quarterly (2010), 878–898.

that avoiding deforestation is affected by time constraints, and that the window of opportunity is closing rapidly. The immediate and long-term benefits of avoided deforestation are going to be higher the sooner any strategy for arresting deforestation gets underway.[8]

The volume continues with a very informative chapter by Pedro Piris-Cabezas (EDF and University of Madrid) that provides a rare overview of the European Union's evolving position on REDD financing. The chapter after that, by Benoit Bosquet, Stefano Pagiola, and André Aquino (World Bank) gives a clear and convenient introduction to the Forest Carbon Partnership Facility and its carbon fund.

The economic focus becomes predominant in the later chapters, some of which may not be easily accessible to non-experts. In particular, the chapters on the stock-flow approach with target reductions (Andrea Cattaneo), on the use of REDD as a hedging tool (Alexander Golub), and on the role of banking (Pedro Piris-Cabezas), are hard to follow for non-economists. Nevertheless, the authors are very well-known for their work on these important technical questions and, overall, the volume provides a valuable snapshot of selected aspects of the debate on REDD prior to COP 15.

As the debate on REDD gained momentum in the framework of the UNFCCC, influential reports indicated that it may be a relatively inexpensive climate change mitigation option, comparing favourably with the costs of lowering emissions in other sectors, because of its potential of achieving significant cost-effective emission reductions in the near term.[9] The Eliasch Review was one of the most influential and comprehensive studies on this issue. The Review was commissioned as an independent report for the UK government and prepared by Johan Eliasch with the support of the UK Office of Climate Change. The review was published in 2008 and, together with the Stern Review (2007) and the Gallagher Review (2008),[10] significantly contributed to shaping the debate on further commitments for UNFCCC parties under negotiation at COP 15. In particular, the Eliasch Review provided the first comprehensive analysis of international financing for reducing forest loss. It carried out an appraisal of extant literature and commissioned studies on the role of an international finance mechanism to reduce the loss of global forests as a method of tackling climate change. Although these issues have subsequently been addressed afresh,[11] the Eliasch Review still provides a valuable reference source on the economic rationale for REDD, and a useful tool for lawyers seeking to grapple with these issues.

[8] Cf. B. Fisher et al., *Issues related to mitigation in the long term context*, *in* B. Metz et al., (eds.), *Climate Change 2007: Mitigation of climate change. Contribution of Working Group III to the Fourth Assessment Report of the Inter-governmental Panel on Climate Change* (2007), at 188.

[9] According to the IPCC, "a sustainable forest management strategy aimed at maintaining or increasing forest carbon stocks, while producing an annual sustained yield of timber, fibre or energy from the forest, will generate the largest sustained mitigation benefit". IPCC, Fourth Assessment Report, Working Group III, at 543. Cf. also N. Stern, The Economics of Climate Change: The Stern Review (2007), at 13.

[10] E. Gallagher, Review of the Indirect Effects of Biofuels Production (2008).

[11] See, for example, D. Zarin et al., Reducing Emissions from Deforestation and Degradation (REDD): An options assessment. Report prepared for the Government of Norway (2009); H. Gregersen et al., Does the opportunity cost approach reflect the real cost of REDD+? (2010).

As parts I and II of the Eliasch Review aptly illustrate, modern deforestation is caused by a complex combination of factors, including various market drivers and policy and governance failures that make it more attractive to fell trees than to keep them standing. Deforestation is not evenly distributed around the globe. It is especially prominent in the tropics. It is mainly caused by the global demand for agricultural and forest products. In numerous countries, land clearing by commercial operators has come to predominate over subsistence activities. As a result, tropical forests are being rapidly depleted and may even disappear by the end of the century.[12]

The steady loss of forests and their services is closely related to their "economic invisibility".[13] One solution may be to make it more cost-effective to keep forests, rather than converting them to cash crops or pastures. The idea behind REDD is therefore quite compelling and straightforward: placing a market value on forest carbon in a new international deal on climate change may reduce emissions in the forest sector, and simultaneously provide a strategy to ensure sustainable forest uses and biodiversity conservation, with great potential benefits for the poor.

The Review reports that the global economic cost of the climate change impact of deforestation will rise to around $1 trillion a year by 2100, if left unabated. The related damage to the global economy could be in the region of $12 trillion in today's dollars. Introducing an international framework to pay forest nations for their global services in reducing emissions may therefore be a convenient way to address the challenge of climate change in a cost-effective way. In this regard, the Review advocates the adoption of an international instrument to halve deforestation by 2020 and make the forest sector carbon-neutral by 2030. The Review estimates the cost of reaching the proposed emission-reduction targets ($17-33 billion per year), the related capacity-building costs ($4 billion over five years), and the level of finance that carbon markets could provide (around $7 billion per year). The Review was the first to come up with such estimates, as well as with a mechanism to finance the reduction of emissions in the forest sector.

To achieve the envisioned targets, parts III and IV of the Review outline a phased approach whereby full global carbon trading would be preceded by a transition period in which a combination of public and private-sector finance would contribute to the establishment of the market. The envisioned strategy consists of four building blocks: first, the development of emission-reduction targets against national baselines; second, the development of robust monitoring and reporting systems for the measurement of emission reductions; third, the development of a mechanism to link forest emission reductions to carbon markets; and, finally, the introduction of strong forest-governance reforms at the national level, which include benefit-sharing provisions specifically targeted at the poor, as well as full-participation requirements.

[12] For example, Soares-Filho et al., estimate that, under business as usual, deforestation could destroy as much as forty per cent of the Amazon forest by 2050. Cf. B. S. Soares-Filho et al., *Modeling Conservation in the Amazon Basin*, 440 Nature 520 (2006).

[13] TEEB, The Economics of Ecosystems and Biodiversity for National and International Policy Makers – Summary: Responding to the Value of Nature, at 4.

Although the inclusion of forest-carbon credits in the global carbon markets remains controversial, negotiations under the UNFCCC have widely drawn upon suggestions included in the Review. The ambitious emission-reduction targets proposed in the Review were included in the text under negotiation in Copenhagen. While the parties could not agree on the adoption of targets, the Cancun Agreements reached at COP 16 endorsed the national approach to baselines recommended in the Review, and prescribed the development of robust monitoring and reporting systems for the measurement of emission reductions.[14] The Agreements themselves adopted a phased approach to address capacity-building for REDD, and the need to ensure collateral benefits was addressed through specific safeguards. Numerous multilateral and bilateral processes have contributed to scale up actions and finance for REDD, though in this connection the Review's recommendation to avoid the proliferation of competing mechanisms has arguably gone unheeded.[15]

More recent studies have further elaborated on the data reported in the Eliasch Review and attempted to flesh out the details of an international mechanism to incentivize the reduction of emissions in the forest sector. In particular, REDD may engender a system of payments for the ecosystem services (PES) provided by forests in developing countries.[16] This is not a path-breaking idea. A number of countries have already introduced domestic schemes to remunerate the ecosystem services provided by forests. The theoretical underpinning for this approach derives from the idea that ecosystem services are public goods, and that people who ensure these services should be rewarded for doing so.[17] In this regard, REDD could streamline the protection of forests' ecosystems services, leading to internalization of externalities[18] and bridging the "forest transition" currently affecting developing countries.[19]

[14] UNFCCC/COP16, *Decision 1/CP.16 Outcome of the work of the Ad Hoc Working Group on long-term Cooperative Action under the Convention* (2010), at IIIc and Appendix I and II.

[15] For an overview on REDD readiness activities, see the website of the UN-REDD Programme, <http://www.un-redd.org>, the webstore of the REDD+ Partnership <http://reddpluspartnership.org/en/>, and that of the Forest Carbon Partnership, <http://www.forestcarbonpartnership.org>. A number of bilateral activities have been undertaken, the most well known being the ones involving Norway with Brazil, Indonesia, Guyana, and Mexico. Cf. <http://www.regjeringen.no/en/>.

[16] Cf. TEEB, The Economics of Ecosystems and Biodiversity for National and International Policy Makers (2009), at 5. Cf. also E. Gómez-Baggethun et al., *The history of ecosystem services in economic theory and practice: From early notions to markets and payment schemes*, 69 Ecological Economics 1209 (2010), at 1214.

[17] S. Olmstead and N. Keohane, Markets and the Environment (2007), at 70.

[18] TEEB, Climate Issues Update (2009), at 10.

[19] P. Meyfroidt, T. K. Rudel, and E. F. Lambin, *Forest transitions, trade, and the global displacement of land use*, PNAS Early Print (2010), at 1. The theory of forest transition is deployed to explain the fact that initially a country has a high and relatively stable portion of land under forest cover. When deforestation begins, it normally accelerates, and forest cover reduces rapidly. At some point, however, deforestation slows, and forest cover stabilizes and begins to recover. This process has been completed in most developed countries, whereas it is still underway in numerous developing countries. As explained by Angelsen, "forest transition is not a law of nature, and transitions are influenced by national contexts, global economic forces and government policies." With appropriate policies, countries may be able to "bridge the forest transition", which is the main aim of REDD. A. Angelsen, *Introduction*, *in* Realising REDD+, A. Angelsen (ed.) (2009), at 4.

By establishing a system of payments to incentivize the continued provision of forests' ecosystem services, REDD may enable developing countries to merge climate change mitigation with conservation and sustainability concerns, thus providing a novel solution to the vexed problem of unsustainable forest uses in the tropics. The debate on these issues has gained crucial momentum in recent years, with the publication of a series of reports on the economics of ecosystems and biodiversity.[20] The reports point to halting deforestation and forest degradation as one of the most urgent strategic priorities to address market failures that characterize the present situation.[21] In this regard, REDD has been described as "the best current opportunity to facilitate the transition to a green economy for forestry".[22] Nevertheless, REDD will not happen in a vacuum, and numerous authors have drawn attention to its implications for forest governance and the societies where it will be implemented.[23]

The issue of REDD's contribution to the livelihood of the poor is specifically analysed in last book reviewed here, *Payments for Environmental Services, Forest Conservation and Climate Change. Livelihoods in the REDD*? The work sets out to assess the impact of existing PES schemes on livelihoods, with the intent to extract lessons that may be learnt for REDD. The term "payments for the ecosystem services" has been defined in several ways in the literature.[24] The work adopts the widely accepted definition developed by Sven Wunder, according to which PES is a "voluntary transaction where a well-defined ecosystem service (or land-use likely to secure that service) is 'bought' by at least one ES buyer from at least one ES provider, if and only if the ES provider secures ES provision (conditionality)".[25] Though the editors recognize its inherent limitations in appreciating the role of intermediaries, the definition is used as a benchmark for all case studies.

The volume is co-edited by Luca Tacconi (Australian National University), author of numerous works on PES and on the social and economic aspects of deforestation and climate change. The eight case studies reported provide a valuable overview of existing PES schemes in Africa, Asia, and Latin America. The studies follow a common structure, which facilitates the comparison of data on the impact on the biophysical environment and the livelihoods of participants and non-participants. The introduction and the conclusion provide useful summaries of the research

[20] TEEB, The Economics of Ecosystems and Biodiversity: An Interim Report (2008); TEEB, The Economics of Ecosystems and Biodiversity: Climate Issues Update (2009); TEEB, The Economics of Ecosystems and Biodiversity: Ecological and Economic Foundations (2010); TEEB, The Economics of Ecosystems and Biodiversity: Mainstreaming the Economics of Nature: A synthesis of the approach, conclusions and recommendations of TEEB (2010).

[21] TEEB (2009), at 4.

[22] UNEP, Towards a Green Economy: Pathways to Sustainable Development and Poverty Eradication - A Synthesis for Policy Makers (2011), at 7.

[23] See, for example, I. Fry, *Reducing Emissions from Deforestation and Forest Degradation: Opportunities and Pitfalls in Developing a New Legal Regime*, 17 Review of European Community and International Environmental Law 166 (2008); J. Costenbader (ed.), Legal Frameworks for REDD: Design and Implementation at the National Level, vol. 77 (2009); L. Cotula and J. Mayers, Tenure in REDD – Start-point or afterthought? Natural Resource Issues No. 15 (2009); L. Peskett et al., Making REDD Work for the Poor (2008); F. Lesniewska, *REDD: The Copenhagen Effect*, 6 Law, Environment and Development Journal 102 (2010).

[24] Cf. E. Gòmez-Baggethun et al., supra note 16, at 1214.

[25] S. Wunder, Payments for Environmental Services: Some Nuts and Bolts. CIFOR Occasional Paper (2005), at 3.

questions addressed throughout the studies, and reflections on the findings reported. The contributors include well-known experts in the field, like Esteve Corbera (University of East Anglia) and Stefano Pagiola (World Bank). The volume is very accessible and coherent, and makes a great addition to the literature on the topic. In particular, the case studies on Costa Rica, Mexico, and Brazil provide fresh data on well-known PES schemes, adding new information and helpful reflections on the potential impact of REDD in these countries. The case studies from Mozambique and Uganda report new data on less-well-known forest-based carbon mitigation projects. The volume also includes an interesting appraisal of twenty-two PES-related projects that received grants from the Global Environment Facility.

The studies demonstrate the viability of PES schemes focused on common-property resources, and of collective payments, particularly where there are strong functioning institutions for collective action. In this connection, the editors suggest that the preferences of participants should be considered in deciding whether the payments are made to individual households or to communities. Evidence from the studies also shows that PES can proceed in the absence of private-property rights, and that partial property rights or recognized customary claims to land may be a sufficient basis for participation. However, while the presence of tenure conflicts is not an insurmountable obstacle, it is certainly a factor that increases the social and sustainability risks, as well as the transaction costs. In this regard, the studies show that transaction costs often require subsidization, and represent a major concern for the viability of PES. As to impact on income, the studies show that payments tend to be a minor component of total household income, which is nevertheless of great importance for the poorest segments of the population. PES-related employment is perceived as a major benefit, though its sustainability in the long run raises some concerns. The editors conclude that data collected in the volume confirms the need to further analyse the performance of PES schemes and their impact on livelihoods.

As to lessons for REDD, the editors find that the case studies indicate that the deployment of PES has the potential to contribute to the livelihood of the poor. However, the achievement of this goal requires social targeting to maximize livelihood benefits, which may not necessarily be aligned with the maximization of carbon benefits. This potential friction needs to be taken into account when carrying out REDD planning. The conclusions further underscore how the PES schemes reviewed have paid little attention to monitoring and enforcement of agreements. This is a primary concern with REDD, and the editors caution that corruption is to be expected and that means to tackle risks need to be developed. The conclusions further highlight the role of intermediary organizations in PES. The editors foresee that this is going to be a salient concern with REDD, and that the related transaction costs are going to be significant. The editors conclude that carefully designed and implemented PES in REDD can have a positive impact on livelihoods, but some trade-offs between environmental and social objectives will be unavoidable. On the whole, the volume provides a helpful review of the opportunities and obstacles of using PES with REDD. It is also a valuable contribution to the debate on REDD's potential impact on livelihoods, a topic that has received much attention lately and upon which further data is needed.

The findings of this work seem to be in line with most recent literature on the subject, voicing concerns about the rhetoric of "win-win" that has accompanied the debate on REDD.[26] This does not mean that inaction on REDD would be a preferable option. It is paramount to be realistic about the objectives that can be achieved through REDD. In this regard, negotiations under the UNFCCC have emphasised the opportunity to generate ecological and social "co-benefits". This term has increasingly appeared in negotiations to indicate REDD's potential to create positive collateral effects,[27] which include both ecosystem-derived as well as broader social benefits.[28]

It is nevertheless important to acknowledge REDD's limitations in this connection. As a proposed mechanism under the UNFCCC, REDD is chiefly about climate change mitigation, and will not be a panacea for forest governance in developing countries. It may also be unwise to further complicate an already troubled negotiation process with requirements for co-benefits, which may impede swift action to ensure forest-carbon sequestration.[29] Be this as it may, the rewards of getting it right stretch beyond climate change mitigation, and include the conservation of some of the world's richest terrestrial ecosystems, as well as the provision of sustainable livelihoods for the poor. The integration of the latter objective within REDD is not only a consideration of justice, but also of opportunity. Forest dwellers and users excluded from the benefits of REDD are likely to resist the implementation of activities that may further curtail the exercise of their customary rights or threaten their subsistence practices and livelihoods.

In this regard, REDD may still present a triple-win solution for climate change, sustainable development, and biodiversity conservation. The extent of these gains, however, greatly depends on the program's design and implementation. While their contours have come into focus with the adoption of the Cancun Agreements in 2010, that was but the first step in a long process that will serve to define the details of REDD. Numerous technical and methodological questions identified in the volumes reviewed here remain to be addressed. If the experience with the CDM is an apt model for comparison, it may be years before the UNFCCC parties are in a position to adopt a fully fledged set of rules for REDD.

[26] See, for example, P. D. Hirsch et al., *Acknowledging Conservation Trade-Offs and Embracing Complexity*, 25 Conservation Biology 259 (2011); T. Sunderland, 'Win-win' is too simplistic a description for REDD+ … and possibly wrong (2011).

[27] For an overview, see UN-REDD, Multiple Benefits-Issues and Options for REDD (2009).

[28] Cf. UNFCCC/COP16, *Decision 1/CP.16 Outcome of the work of the Ad Hoc Working Group on long-term Cooperative Action under the Convention* , Appendix I, at 2(e): "Actions are consistent with the conservation of natural forests and biological diversity, ensuring that actions … are not used for the conversion of natural forests, but are instead used to incentivize the protection and conservation of natural forests and their ecosystem services, and to enhance other social and environmental benefits".

[29] J. Busch et al., *Biodiversity Co-Benefits of Reducing Emissions From Deforestation Under Alternative Reference Levels and Levels of Finance*, October Conservation Letters 1 (2010), at 12.